

VALVATA PISCINALIS (MÜLLER) IN THE GREAT LAKES

BY JOHN OUGHTON

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Summary of the Known Range in the Great Lakes.—The above statement shows that *V. piscinalis* is well established and widespread in Lake Ontario, where it is known to occur from Belleville on the east to Port Dalhousie on the west. It seems likely that further search on the southern shore will establish a greater range there than the two records would suggest.

The single shell reported by Mr. Blakeslee (in letter) from Lake Erie (a well collected region) may be the vanguard of the invasion of the species into that lake. Such encroachment would likely take place via the Welland Canal, since *V. piscinalis* is common at the Lake Ontario end of this ship channel.

Habitat and Abundance.—In the Great Lakes, *V. piscinalis* apparently thrives in protected sites, as it does in its European haunts. Thus in the vicinity of Toronto it is most abundant by far in the well-protected lee of the breakwater at Sunnyside Beach, while it is only moderately abundant at Toronto Island in Toronto Bay, where there is a mile exposure of open water, and it is uncommon on the lake side of Toronto Island (only 2 shells were found in a 100-yard strip of beach examined), which was exposed to the open lake. Any discussion of abundance in a given area must therefore take into consideration the types of habitats available.

In order to obtain a precise estimate of the population of the present species, extensive sampling and dredging of the animals in life would have to be carried out. Lacking this information, the writer offers two rough standards of comparison, based on the numbers of dead shells found on the beaches at Toronto.

1. Number per unit time of collecting. Location, Lake Ontario, near mouth of Humber River (Sunnyside Beach) behind breakwater. (a) Fall, 1913. Justice F. R. Latchford informed the writer that he obtained about 15 to 20 shells in about one-half hour. (b) On a site of moderate density of drift shells, the writer collected 128 shells in 15 minutes, Dec., 1937.

2. Random collecting, *i.e.*, number per unit area of beach. Four samples were obtained by scooping up all the shells within marked-off areas: Lake Ontario. (a) Toronto Island, Toronto Bay, May 22, 1937.

	<i>Sample A</i>	<i>Sample B</i>
Total number of shells collected	35	142
Total number of species collected	10	14
<i>V. piscinalis</i>	23%	18%
<i>Bulimus tentaculatus</i>	37%	42%
<i>Amnicola</i> spp.	6%	14%
<i>Gyraulus parvus</i>	11%	4%
<i>Physa</i> spp.	9%	5%
Other aquatics	14%	17%

- (b) Sunnyside beach, behind the breakwater (May 21, 1937 and Dec. 19, 1937).

	<i>Sample A</i>	<i>Sample B</i>
Total number of shells collected	153	1482
Total number of species collected	11	33
<i>V. piscinalis</i>	20%	34%
<i>Gyraulus parvus</i>	68%	46%
<i>Physa</i> spp.	3%	7%
Sphaeriidae spp.	1%	3%
Other aquatics	8%	10%

Details of Its Introduction.—There is no precise information at hand concerning the date, locality, means or source of introduction. *V. piscinalis* probably first colonized the western part of Lake Ontario, since in this area it seems to be most abundant now (*e.g.*, two suitably protected sites were examined in eastern Lake Ontario in 1936, and the species was uncommon or absent). The date of introduction was probably not much prior to 1898, as there is no mention of it in earlier lists, *viz.*, A. W. Hanham, "List of the land and freshwater shells of the Hamilton district . . .," Journ. & Proc. Ham. Assoc., pp. 111–120, 1890, and H. A. Nicholson, "Contrib. to a Fauna Canadensis . . ." Can. Journ. n.s., 3: 490–506, 1872. In fact, Nicholson collected in the shallows of the bay at Toronto Island, where it is now common.

Variation. The sixteen hundred shells of *V. piscinalis* from Lake Ontario contained in the collections of the Royal Ontario Museum of Zoology belong in the writer's opinion to the typical form of *V. piscinalis*, although series of the European varieties are lacking for comparison. Thirty-five of the largest specimens in this collection were selected and measured, with the following results: Number of whorls, average $3\frac{3}{4}$, extremes $3\frac{1}{2}$ and $4\frac{1}{4}$; length, average 5.0 mm., extremes 4.0 and 6.1; breadth, average 5.2 mm., extremes 4.5 and 6.0. In most instances the breadth is equal to, or greater than, the length. These figures differ slightly from those given by Ellis in "British Snails" 1926, p. 87: 5 or 6 whorls, breadth 5 to 7 mm., height slightly more. The variation in the Lake Ontario shells is noticeable but small with respect to the elevation of the spire, size of umbilicus and the sculpture (malleation).

Mr. F. C. Baker noted (in letter) that there was considerable variation in his lot of shells.

SUMMARY

1. *Valvata piscinalis* (Müller), which was first reported from Lake Ontario in 1898, now has a wide range in that lake, and may be spreading into Lake Erie.

2. Judging by the number of dead shells washed up, this species at Toronto has greatly prospered during the last twenty-four years, so that now it comprises about one-quarter of the total molluscan population of protected parts of Lake Ontario at this city.

3. The details of its introduction are unknown.

4. Only the typical form of *V. piscinalis* has been found.

THURAL DALE FOSTER

(September 27, 1897—June 6, 1936)

Thural Dale Foster entered the University of Illinois as a graduate student in the summer of 1929. He had taught for five years in the high schools of Lamoille, Cambridge, and Geneseo, Illinois, after receiving the Bachelor's degree from Shurtleff College in 1924. In September, 1929, he became a graduate assistant in zoology in the University of Illinois, a position which he held until his death on June 6, 1936, except for one year when an at-